

**Amendment to the Claims:**

1. (Currently Amended) A system for calibrating a solid state detector for a radiation imaging device in a single acquisition, the system comprising:

a means for emitting radiation concurrently of at least first and second preselected energy levels, the means for emitting radiation being located in an  
5 imaging region of a nuclear imaging device;

a means for generating associated sets of radiation data spanning both the first and second energy levels from the emitted radiation that is received by solid state detector;

a means for determining associated centers of energy peaks and energy  
10 values of the generated data sets; and

a means for calibrating at least one of gain, offset, performance and dead pixel correction based on the determined centers and peaks of the acquired data sets.

2. (Previously Presented) The system as set forth in claim 1, wherein the radiation emitting means includes:

a tank, which holds a radioisotope which emits radiation at the first energy level; and

5 a means which receives radiation of the first energy level and emits radiation at the second energy level.

3. (Original) The system as set forth in claim 2, wherein the radioisotope in is a liquid solution.

4. (Previously Presented) The system as set forth in claim 3, wherein the means, which emits radiation at the second energy level, includes:

a dense metal sheet disposed along a rear side of the tank opposite the solid state detector, the dense metal sheet emitting the second energy level radiation  
5 by secondary emission.

5. (Previously Presented) The system as set forth in claim 4, further including a second metal sheet disposed along a front side of the tank between the radioisotope and the solid state detector, the second metal sheet receiving radiation of the first energy level and emitting radiation of another energy level.

6. (Previously Presented) The system as set forth in claim 5, wherein the dense and second metal sheets include lead and emit secondary radiation at 70keV.

7. (Previously Presented) The system as set forth in claim 1, wherein the radiation emitting means includes a single dual peak isotope which emits radiation at both the first and the second energy levels concurrently.

8. (Previously Presented) The system as set forth in claim 7, further including:

a source of a secondary radiation, which converts some of the radiation emitted by the dual peak isotope to a characteristic energy level.

9. (Previously Presented) The system as set forth in claim 1, wherein the radiation emitting means includes a mixture of isotopes, each isotope emitting radiation at at least one energy level.

10. (Previously Presented) The system as set forth in claim 9, further including:

a source of a secondary radiation which receives radiation from the isotope mixture and emits radiation at a characteristic energy level lower than the  
5 energy levels of at least some of the radiation emitted by the isotope mixture.

11. (Previously Presented) The system as set forth in claim 1, wherein the solid state detector includes an array of detector elements that convert

gamma radiation directly into electrical charge and the generating means generates a set of radiation data for each detector element.

12. (Currently Amended) A method of calibrating a solid state detector in a nuclear imaging system comprising:

concurrently emitting radiation at at least first and second preselected energy levels from within an imaging region of the nuclear imaging system;

5 generating associated sets of radiation data from the emitted radiation received by the detector;

determining centers of energy peaks and energy values for the generated data sets; and

10 calibrating at least one of gain, offset, performance and dead pixel correction based on the determined centers and peaks of the acquired data sets.

13. (Original) A calibration phantom for a pixilated solid state detector, the phantom comprising:

a radioisotope layer which emits radiation of a first characteristic energy; and

5 a metal layer disposed parallel to the radioisotope layer to receive the radiation of the first characteristic energy from the radioisotope layer and emit radiation of a second characteristic energy by a secondary emission.

14. (Original) The calibration phantom as set forth in claim 13, wherein the radioisotope layer includes a radioisotope in liquid solution.

15. (Original) The calibration phantom as set forth in claim 14, wherein the liquid solution includes a plurality of radioisotopes each having a characteristic energy.

16. (Original) The calibration phantom as set forth in claim 14, wherein the radioisotope includes a radioactive isotope of at least one of Technetium, Gallium, Americium, Cobalt, and Germanium.

17. (Original) The calibration phantom as set forth in claim 13, wherein the metal layer is one of Lead, Copper, Molybdenum, Tungsten, and Tin.

18. (Original) The calibration phantom as set forth in claim 13, wherein the radioisotope has a dual energy peak.

19. (Original) In combination, the phantom of claim 13 and a pixilated nuclear camera, and further including:

a pixel energy peak analyzer which finds energy peaks generated about the first and second characteristic energies for each pixel of the pixilated nuclear camera; and

a calibration processor which utilizes the energy peaks information to at least one of correct each pixel's gain and offset, regulate the nuclear camera's overall performance, and recover dead pixels areas.

20. (Previously Presented) An energy level calibration phantom configured to be disposed in an imaging region of a nuclear imaging system for calibrating a solid state detector of the nuclear imaging system, the phantom comprising:

a radioisotope layer which emits radiation of a first characteristic energy; and

a ~~second~~ layer that receives the radiation of the first characteristic energy from the radioisotope layer and emits radiation of a second characteristic energy by a secondary emission.

21. (Currently Amended) The method as set forth in claim 12 ~~21~~, wherein the generating step includes:

detecting the emitted radiation with a solid state detector that converts radiation into electrical charge; and

generating the sets of radiation data from the electrical charge.

22. (New) The phantom as set forth in claim 20, further including:  
a reservoir which holds the radioisotope which emits the radiation of  
the first characteristic energy;  
the reservoir and the layer which emits the radiation of the second  
5 characteristic energy by secondary emission being positioned adjacent in the imaging  
region such that the solid state detector receives the radiation of the first energy and  
the radiation of the second energy and generates energy indicative electrical signals  
which are indicative of the energy of the received radiation in response to the received  
radiation;  
10 one or more processors that processes the electrical signals to  
determine a first energy peak corresponding to the radiation of the first energy and a  
second energy peak corresponding to the second energy and that calibrates the energy  
indicative electrical signals of the solid state detector such that signals of the first peak  
are indicative of the first characteristic energy and signals of the second peak are  
15 indicative of the second characteristic energy.